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## The Under Secretary of Energy

Washington, DC 20585

MAY 09 1991

The Honorable Ron De Lugo  
Chairman, Subcommittee on Insular  
and International Affairs  
Committee on Interior  
and Insular Affairs  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

I am writing to you in response to your letter of October 5, 1990, to Mr. Harry U. Brown, Nevada Operations Office (NV), and to your letter of November 19, 1990, to Mr. Nick C. Aquilina, Manager, NV, in which you requested a copy of the study referenced under "objectives" of the "Radiological Survey Plan for the Northern Marshall Islands," Department of Energy (DOE), August 22, 1978. I am sorry for the lengthy time in responding to your request. It has been difficult finding the appropriate individuals who participated in the study. A thorough search has been necessary to verify if a formal report of the study was indeed prepared.

The "DOE study" you referenced was, in fact, a review by the technical staff at Headquarters, Atomic Energy Commission (AEC), of files containing information on nuclear tests conducted at Bikini and Enewetak atolls. We contacted Mr. Tommy McCraw who was an AEC employee at that time and was one of the technical staff members involved. According to Mr. McCraw, the review included available radiological monitoring data and the meteorological information for each test. For the tests with the higher fission yields, fallout trajectories were developed from the winds for the day of the test, and atolls were identified that most likely received close-in fallout. The calculations used to do this analysis were prepared as draft working notes, were never formally published, and are no longer available. The only published information from this "DOE study" was included as Tab 8 (Enclosure 1) of the report referenced above. This enclosure identifies the 11 atolls and 2 islands that were designated for inclusion in the 1978 Aerial Radiological Survey.

The logistical aspects of obtaining the aerial survey data used to conduct this screening survey were coordinated by NV. The NV had no role, however, in the analysis of the data and the development of the data in Tab 8.

Enclosure 2 is a Preface that describes the process by which this chart of the atolls and islands to be surveyed was determined. This Preface was never published as a part of any survey report. It is provided to assist you in your understanding of how the study was conducted.

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It should be emphasized that the subject radiological survey was performed to better define the region receiving higher levels of fallout and to identify where additional sampling should be performed. The survey was never intended to be a comprehensive analysis of fallout location throughout the entire region. The ongoing Republic of the Marshall Islands Nationwide Radiological Study being conducted by Dr. Steven Simon represents a far more exhaustive study, and should provide a more complete picture on the total extent of contamination throughout the area.

We hope you will find this information useful.

Sincerely,

John C. Tuck

2 Enclosures

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ATTACHMENT 1

TAB 8

APPENDIX 1

FALLOUT FROM PACIFIC TESTS

FALLOUT PATTERN-BRAVO EVENT 1954

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FALLOUT FROM PACIFIC TESTS

<u>ATOLLS IN FALLOUT AREA</u>	<u>EVENTS</u>	<u>LOCATION</u>	<u>DATE</u>
AILINGINAE	SANDSTONE-ZEBRA	ENEWETAK	5/48
	CASTLE-BRAVO	BIKINI	2/54
	CASTLE-UNION	BIKINI	4/54
	CASTLE-YANKEE	BIKINI	5/54
	HARDTACK-MAPLE	BIKINI	6/58
AILUK	CASTLE-BRAVO	BIKINI	2/54
BIKAR	CASTLE-BRAVO	BIKINI	2/54
	CASTLE-YANKEE	BIKINI	5/54
BIKINI	ALL BIKINI EVENTS	-	-
LIKIEP	CASTLE-BRAVO	BIKINI	2/54
RONGELAP	SANDSTONE-ZEBRA	ENEWETAK	5/48
	CASTLE-BRAVO	BIKINI	2/54
	CASTLE-UNION	BIKINI	4/54
	CASTLE-YANKEE	BIKINI	5/54
RONGERIK	SANDSTONE-ZEBRA	ENEWETAK	5/48
	CASTLE-BRAVO	BIKINI	2/54
	CASTLE-UNION	BIKINI	4/54
	CASTLE-YANKEE	BIKINI	5/54
TAKA	CASTLE-BRAVO	BIKINI	2/54
UJELANG	IVY-KING	ENEWETAK	11/52
	HARDTACK-MAGNOLIA	ENEWETAK	5/58
UTIRIK	CASTLE-BRAVO	BIKINI	2/54
WOTH0	CASTLE-BRAVO	BIKINI	2/54
	HARDTACK-MAPLE	BIKINI	6/58
JEMO ISLAND*	CASTLE-BRAVO	BIKINI	2/54
MEJIT ISLAND*	CASTLE-BRAVO	BIKINI	2/54

\*The term "Island" is used in this case to denote an isolated island that is not part of an atoll and does not have a lagoon.

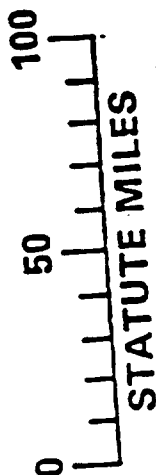
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# FALLOUT PATTERN

BRAVO EVENT

MARCH 1954

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ESTIMATED INTERMEDIATE CONTOUR

HIGH LEVEL CONTOURS

BIKAR ATOLL

UTIRIK ATOLL

TAKA ATOLL

MEJIT ISLAND

AILUK ATOLL

JEMO ISLAND

LIKIEP

ATOLL 170°

RONGERIK ATOLL

RONGELAP ATOLL

ALINGINAE ATOLL

BIKINI ATOLL

WOTHO ATOLL

168°

10°

10°

Hist. Rad Safe Records  
Tom F. McCraw  
14339 Royer Rd.  
Cascade MD 21719

## PREFACE

## Northern Marshalls Survey Report

The survey of thirteen islands and atolls in the Northern Marshalls resulted from efforts by Atomic Energy Commission (AEC) staff to determine what information would be needed in the future to support the termination of the United States Trust Territory of the Pacific Islands. The Federal agencies currently having primary responsibilities and interests in the Marshalls are the Department of the Interior (DOI) and the Department of Defense (DOD). DOI has health and environmental responsibilities under the Trust Territory Agreement, and the DOD has programmatic responsibilities related to national security.

AEC, now the Department of Energy (DOE) participated in a series of inter-agency agreement with DOI and DOD that were related to cooperative efforts to rehabilitate Bikini and Enewetak Atolls. Under these agreements, AEC/DOE provided technical information and advice on radiological conditions in the Marshalls. AEC/DOE contractors have carried out the radiological surveys that provide needed data to evaluate radiological conditions which must be known in order to advise DOI and DOD. These data resources are being maintained and enlarged by DOE's contractors, primarily the Lawrence Livermore National Laboratory and the Brookhaven National Laboratory.

In preparation for cleanup of Enewetak, an aerial survey of the islands of this atoll was conducted in September-November, 1972, using sensitive radiation monitoring and position fixing equipment carried in helicopters. Flown along close spaced parallel tracks at low altitudes, the system measured the external gamma radiation field and the contribution to this field by each fallout and

activation product radionuclide in the soil, i.e., those that are gamma emitters. Transuranium element gamma emitters are also detected. Every second, the equipment records the gamma spectra and position fixing signals on magnetic tape. The tapes containing gamma radiation data for each flight were printed out and used as an overlay for maps of each island in the field.

The success of this survey (39 islands surveyed in just sixteen days) right away raised the question of use of this equipment to expand the data base for Bikini Atoll where the numbers and locations of radiation measurements and the amount of spectral data had been limited by dense vegetation and difficult access.

The initial intent by AEC staff was to plan and conduct an aerial survey of Bikini Atoll only using the same equipment and contractor, EG&G, as at Enewetak and with helicopter support provided by the DOD. In determining the logistics support that would be required for the Bikini survey it was determined that Bikini Atoll provided little in the way of facilities that could be used by the survey team and helicopter crews. A ship would be needed that could store, launch, and recover helicopters and provide a base of operations for the survey. The major costs would be to get the ship and helicopters in place. This raised the prospect that several atolls in the Marshalls could be surveyed with only a modest additional cost.

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The problem was to plan a survey that would cover enough area and atolls to define the region where higher levels of fallout may have occurred, but not so extensive and costly that funding could not be obtained. This led to the concept of conducting what may be described as a screening survey, e.g., a survey where results could be used to determine whether or not any further survey effort was needed. For such a survey there is also the possibility that if any unexpected results are obtained, some modification of the survey plan can be made during the survey.

AEC staff reviewed the technical files containing information on all nuclear tests conducted at Bikini and Enewetak Atolls, the available radiological monitoring data, and the meteorological information for each test. For the tests with the higher fission yields, and using fallout trajectories developed from the winds for the day of the test, atolls that most likely received close-in fallout were identified by inspection. Lacking radiological measurements in the downwind area that could confirm or deny the presence of fallout for a number of tests and atolls, this was considered the best approach for a screening survey plan.

The list of locations that was developed contained 13 islands and atolls (including Bikini and excluding Enewetak). In this were two single islands and eleven atolls with each atoll contained a number of islands. In order to characterize radiological conditions in the atolls, the larger islands and



particularly village islands would be surveyed, and additionally several smaller islands such that each quadrant of the atoll would be measured if there were islands in all quadrants.

Because of the distances between atolls and the large number of islands to be surveyed, the survey was divided into three separate trips with refueling, resupply, and rotation of survey personnel between the trips. Scientists would review preliminary data for each day's aerial survey to determine if additional measurements were needed.

As the survey plan evolved it became clear that it would be a serious mistake to mount an extensive aerial survey in the Northern Marshalls and not collect environmental samples for all areas visited. A requirement to collect soil, water, and marine and terrestrial foods was added to the plan.

The absence of accurate and up-to-date maps of these islands and atolls hindered detailed planning. A requirement for an aerial photographic mission was developed. Photographs of each island to be surveyed were obtained in July-Sept. 1978 using a Navy EC-121 aircraft.

The radiological survey in the Northern Marshalls was conducted during the period September 18 through November 10, 1978. Sixty-six islands were surveyed. The vessel used in the survey was the USNS Wheeling with support from personnel

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at the Pacific Missile Test Center, Point Mugu, California, and at the Kwajalein Missile Range, Kwajalein Atoll. Helicopter support was provided by personnel of the U.S. Navy HC-1 Helicopter Squadron, San Diego, California. Personnel of EG&G supported the photographic and aerial surveys. Personnel of the Lawrence Livermore National Laboratory conducted the environmental survey. DOD's logistics costs were reimbursed by DOI. DOE funded technical support costs for the survey.

The new information in this report will be interpreted and evaluated elsewhere. However, it may be said that the trends in the radiation data<sup>and</sup> and in the total dose estimates in this report do not indicate any unusual findings. It was expected that fission product radiation and radioactivity levels and accompanying radiation doses would decline with distance from the test atolls, and that these values would approach levels equivalent to world-wide fallout at the ~~perimeter~~<sup>perimeter</sup> of the region of close-in fallout. This did occur within the area surveyed.

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U.S. HOUSE OF REPRESENTATIVES  
WASHINGTON, DC 20515

October 5, 1990

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Mr. Harry U. Brown  
Deputy Program Manager  
Office of Emergency Response  
and Program Analysis  
Nevada Operations Office  
Department of Energy  
P. O. Box 95818  
Las Vegas, Nevada 89113

Dear Mr. Brown:

The Subcommittee is attempting to locate a DOE study prepared, as we understand it, at the direction of -- or even directly by -- the Nevada Operations Office. According to "Objectives" set forth in the RADIOLOGICAL SURVEY PLAN FOR THE NORTHERN MARSHALL ISLANDS, Department of Energy, August 22, 1978:

A study has identified 11 atolls and 2 islands as those most likely to have received fallout from one or more nuclear tests conducted at Bikini and Enewetak during the U.S. Pacific testing program.

Would you kindly provide the Subcommittee with a copy of this study referenced in the Survey Plan as soon as possible.

Many thanks.

Sincerely,

*Ron De Lugo*  
RON DE LUGO  
Chairman

Subcommittee on Insular and  
International Affairs

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## Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

November 1, 1990

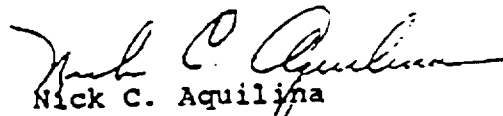
The Honorable Ron de Lugo  
Chairman, Subcommittee on  
Insular and International Affairs  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

Your letter to Harry U. Brown, dated October 5, 1990, requested a copy of a study which identified certain atolls and islands likely to have received fallout from U.S. nuclear tests at Enewetak and Bikini.

The Nevada Operations Office of the U.S. Department of Energy (DOE) did not undertake or direct such a study. Our Headquarters, Office of Environment, Safety and Health (EH), is in touch with those individuals, some of whom have since retired from DOE, who would be able to address your question. EH will respond directly to you when this information is located.

Sincerely,

  
Nick C. Aquilina  
Manager

cc:

C. Rick Jones, DOE/HQ,  
(EH-41) GTN

Dep. Asst. Sec. for  
Intergovernmental &  
Public Liaison, DOE/HQ  
(CP-30) FORS

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## COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

U.S. HOUSE OF REPRESENTATIVES  
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November 19, 1990

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Mr. Nick C. Aquilina  
Manager  
Department of Energy  
Nevada Operations Office  
P. O. Box 98518  
Las Vegas, Nevada 89193-8518

Dear Mr. Aquilina:

I am concerned by your November 1 response to my letter of October 5 to Harry Brown and ask that you review my request as soon as possible.

The Subcommittee's ongoing investigation suggests that DOE's study requested in my letter was part of the survey managed by DOE's Nevada Operations Office and described in the "Operations Plan -- Northern Marshall Islands Radiological Survey" that was signed by Mahlon E. Gates.

I do not find it reassuring that a copy cannot be located. It would be most disconcerting to learn that your office does not have a copy of this study given the importance and sensitivity of this matter. It would raise a question about whether this information has been destroyed or mislaid.

Would you therefore please:

- immediately ascertain that the integrity of this study has not been compromised;
- identify the individual who prepared the study; and
- provide the Subcommittee with a copy of the study.

A response no later than November 30 would be very much appreciated.

Sincerely,

RON DE LUGO  
Chairman

Subcommittee on Insular and  
International Affairs

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